

**Semi-annual Reports for NASA-Ames Research Center
Cooperative Agreement **Aerospace Human Factors** (NCC 2-327)
with the Psychology Department, San Jose State University**

**Kevin Jordan, Professor and Project Director
Department of Psychology
San Jose State University
San Jose, CA 95192**

**February 1, 1995 to July 31, 1995
August 1, 1995 to January 31, 1996**

The Technical Monitor for the Cooperative Agreement is Dr. R. Key Dismukes, Senior Staff Scientist, Flight Management and Human Factors Division, NASA-Ames Research Center, Moffett Field, CA 94035

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Aerospace Human Factors

The following contains the semi-annual reports on the activities related to the Cooperative Agreement between the Flight Deck Research and Human and Systems Technology Branches (Codes AFF and AFH) of the Flight Management and Human Factors Division at NASA-Ames Research Center and the Psychology Department at San Jose State University (NCC 2-327). The inclusive dates for the reports are February 1, 1995 to January 31, 1996. Dr. Jordan, a Professor of Psychology at San Jose State University and the Project Director, assumed the Project Directorship on June 1, 1985.

The Cooperative Agreement provides for research personnel to collaborate with senior scientists in ongoing NASA-ARC research. Many of these research personnel are candidates for the MA in Psychology degree at San Jose State University, although there are some upper-division undergraduates participating in the agreement as well as post-MA Project Assistants and Project Associates. The following is a list of the Cooperative Agreement personnel during the period covered by this report (nonadministrative personnel are listed by branch affiliation):

Project Director

Kevin Jordan (Ph.D., Kansas State University, 1982)

Research Advisers

Robert Cooper (Ph.D., University of Minnesota, 1972)

Laree Huntsman (Ph.D., University of Wisconsin, 1991)

Project Secretary

Diane Wood (M.S., San Jose State University)

Code AFF - Flight Deck Research**Student Research Assistants**

Sean Belcher (MA candidate)

Robert Edmiston (MA candidate)

Jason Lawrence (MA candidate)

Stephen Sheldon (MA candidate)

David Tu (MS candidate)

Code AFH - Human and Systems Technologies**Project Associates**

Durand Begault, Ph.D.

Lori Bernstein, Ph.D.

Francois Breant, Ph.D.

Eric Ruthruff, Ph.D.

Project Assistant

William Briggs, B.S.

Student Assistants

Will Aiken (Ph.D. candidate)

Barry Crane (MA candidate)

Jonathan Levy (Ph.D. candidate)

Brian Menges (BS candidate)

Michael Montegut (Ph.D. candidate)

Maria Romera (MA candidate)

Activities of the Cooperative Agreement Personnel

As with previous semi-annual reports, cooperative agreement personnel were asked to submit a list of their contributions to the branch over the past year to the Project Director. The contributions listed were many and varied, ranging from programming, running subjects, coding and entering data, literature reviews, and the design and execution of original research.

Given the variety of responsibilities of the personnel, this report presents a reference list of the projects at NASA-ARC in which the students and other personnel have been involved. It should be pointed out, however, that many personnel whose names do not appear among these references have made substantial contributions to the research process.

References to Cooperative Agreement Personnel Research

Begault, D. R., & Pittman, M. T. (1995). 3-D Audio Versus Head Down TCAS Displays. In R. S. Jensen (Ed.), *Proceeding of the Eighth International Aviation Psychology Symposium Conference*. Columbus, OH: The Ohio State University.

Begault, D. R. (1995). Head Up Auditory Display Research at NASA Ames Research Center. *Proceedings of the Human Factors Society 39th Annual Meeting* (pp. 114-118). Santa Monica, CA: Human Factors Society.

Begault, D. R. (1995). Multichannel Spatialization System for Audio Signals. United States Patent 5,438,623. Washington, DC: Commissioner of Patents and Trademarks.

Begault, D. R. (1995). Virtual acoustic displays for teleconferencing: Intelligibility advantage for "telephone grade" audio. *Audio Engineering Society 98th Convention* preprint 4008. New York: Audio Engineering Society.

Begault, D.R. (1995). An Introduction to 3-D Sound. *Tutorial presented at Informatique '95: Interface to Real and Virtual Worlds, Montpellier, FR*. Paris, FR: EC2 et Cie.

Edmiston, R. E. (1996). *Attentional issues in superimposed head-up display symbology*. Unpublished Masters Thesis, San Jose State University.

Ellis, Stephen R. and Menges, Brian M. (1995) Judged distance to virtual objects in the near visual field. *Proceedings of the Human Factors and Ergonomics Society, 39th Annual Meeting*. San Diego, CA, 1400-1404.

Ellis, Stephen R. , Bucher, Urs J. and Menges, Brian. (1995, June). *The Relationship of Binocular Convergence and Errors In Judged Distance to Virtual Objects*. Proceedings of the International Federation of Automatic Control, Boston, Mass.

Foyle, D.C., McCann, R.S., & Shelden, S.G. (1995). Attentional issues with superimposed symbology: Formats for scene-linked displays. In R. S. Jensen (Ed.), *Proceeding of the Eighth International Aviation Psychology Symposium Conference*. Columbus, OH: The Ohio State University.

Tu, D.S., & Andre, A. D. (Under review). *Integration of navigational information in aircraft ground navigation*.

Activities of the Project Director

a. Papers

Jordan, K., & Huntsman, L. A. (1995). Repetition of misoriented words reduces lexical decision response times at repeated and novel orientations. *Journal of Experimental Psychology: Human Perception & Performance*, 21, 963-977.

Jordan, K., & Johnson, J. M. (in preparation). Word-length affects misoriented words: Evidence for letter-by-letter reading. To be submitted to *Perception & Psychophysics*.

Jordan, K., Elliott, N. L., & Litwin, J. L., (in preparation). A two-stage model of processing misoriented words. To be submitted to *Memory & Cognition*.

b. Paper presentations

Jordan, K., Litwin, J. L., & Elliott, N. L. (November, 1995). *"Directional" letters facilitate the processing of misoriented words*. Paper presented at the annual meeting of the Psychonomic Society, Los Angeles.

Jordan, K., Elliott, N. L., & Litwin, J. L. (March, 1995). *A two-stage model of processing misoriented words*. Paper presented at the annual meeting of the Western Psychological Association, Los Angeles.